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Fall Trumpeter Swan Survey of the High Plains Flock

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Introduction

The annual fall trumpeter swan survey is conducted to determine production and distribution for a portion of the Interior Population of trumpeter swans called the High Plains Flock, in accordance with the Interior Population and High Plains Flock trumpeter swan management plans (1997 and 2005, respectively). Each plan outlines population objectives (VI-2 and A-1) and management strategies for monitoring population status, which includes aerial surveys in South Dakota and Nebraska. These surveys are part of a trumpeter swan monitoring program that spans over two decades to track abundance trends in the flock and condition of the wetlands swans inhabit.

Methods

The survey was conducted from September 4th to September 6th, 2007. We assumed that movement of swans was limited within this time frame; thus, double counting of swans was deemed minimal or non-existent. An aerial cruise survey was completed using a Cessna 206 airplane, flying at elevations of 800 to 1000 ft AGL and at speeds of 120 knots. The weather conditions were favorable with clear skies, low winds of 5 to 10 mph on the ground, and temperatures 85 to 100º F.

When a potential swan was sighted, the survey biologists verified whether it was a swan and, if so, classified its age and social status. Swans were categorized as (1) pairs with or without broods, (2) singles with or without broods, (3) cygnets, or (4) groups. Adult and subadult birds were recorded as white birds, and gray birds were classified as cygnets. The survey biologist also evaluated habitat conditions (i.e., availability of food resources and water) from the air.

The traditional survey route included much of northwest Nebraska, southwest South Dakota, and Wyoming (Fig. 1). This year Wyoming (Colony site) was excluded from the route because there have been no swans sighted there for 7 years, and the distance to the survey site increases the expense of the survey substantially. The area can be monitored from the ground, and if swans return to Colony, that portion of the route may be reinstated.

Results

During the 2007 survey biologists counted 398 swans in the High Plains Flock. This is a decrease of 7% from the 2006 estimate (Fig. 2), and was primarily the result of a lower number of non-breeding pairs and a very small drop in single birds (18 to 7). However, the number of breeding pairs remained relatively stable and cygnets increased slightly. The 2007 results are above the 18-year average for white birds (203 ± 17) and total birds (282 ± 19), but not cygnets (80 ± 5). The Flock continues to experience a positive growth rate of 4.5% annually from 1990 to 2007 (Fig. 3). The overall production of cygnets increased this year and the index of production rate (i.e., cygnets/white birds) was low (0.24) compared to the long-term average (0.44). The specific results for each category are listed in Table 1.

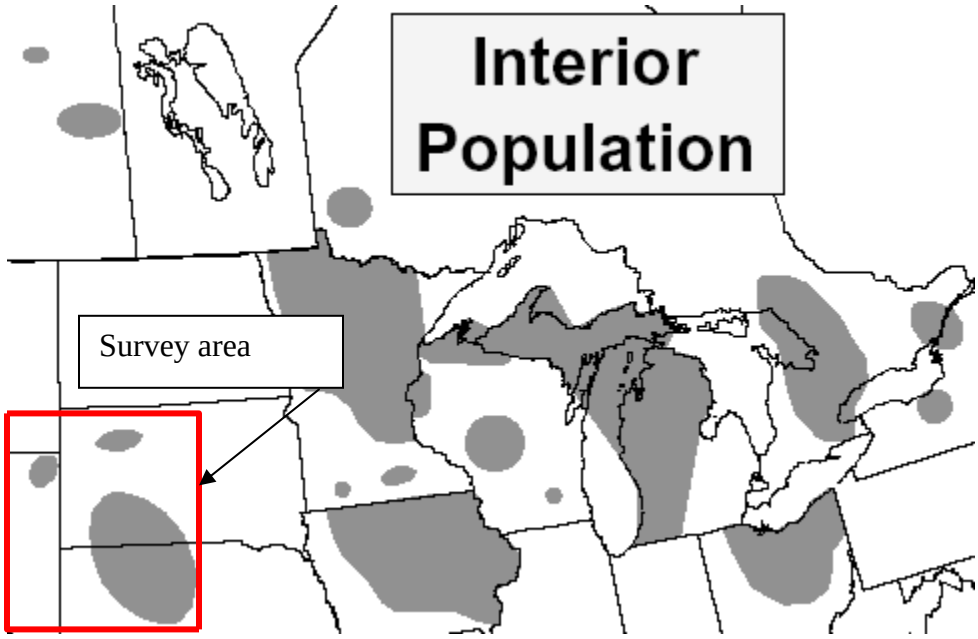
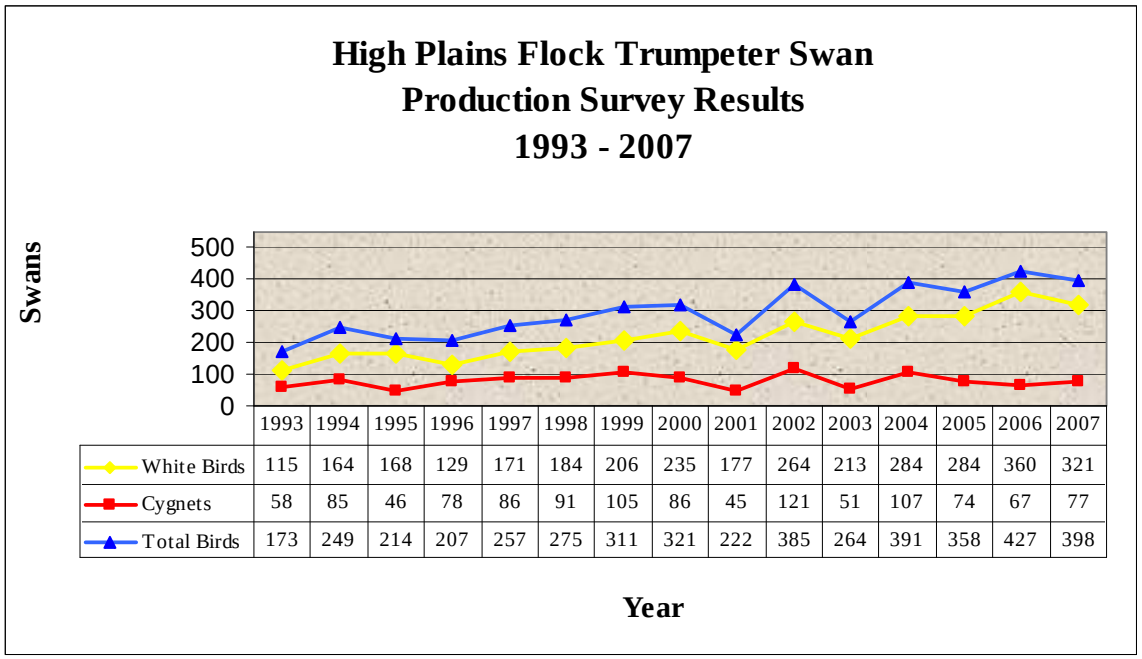


Figure 1. Survey area for High Plains Flock trumpeter swans located in southwest South Dakota and northwest Nebraska.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
White Birds	115	164	168	129	171	184	206	235	177	264	213	284	284	360	321
Cygnets	58	85	46	78	86	91	105	86	45	121	51	107	74	67	77
Total Birds	173	249	214	207	257	275	311	321	222	385	264	391	358	427	398

Figure 2. High Plains Flock Trumpeter Swan Production Survey Results 1993-2007.

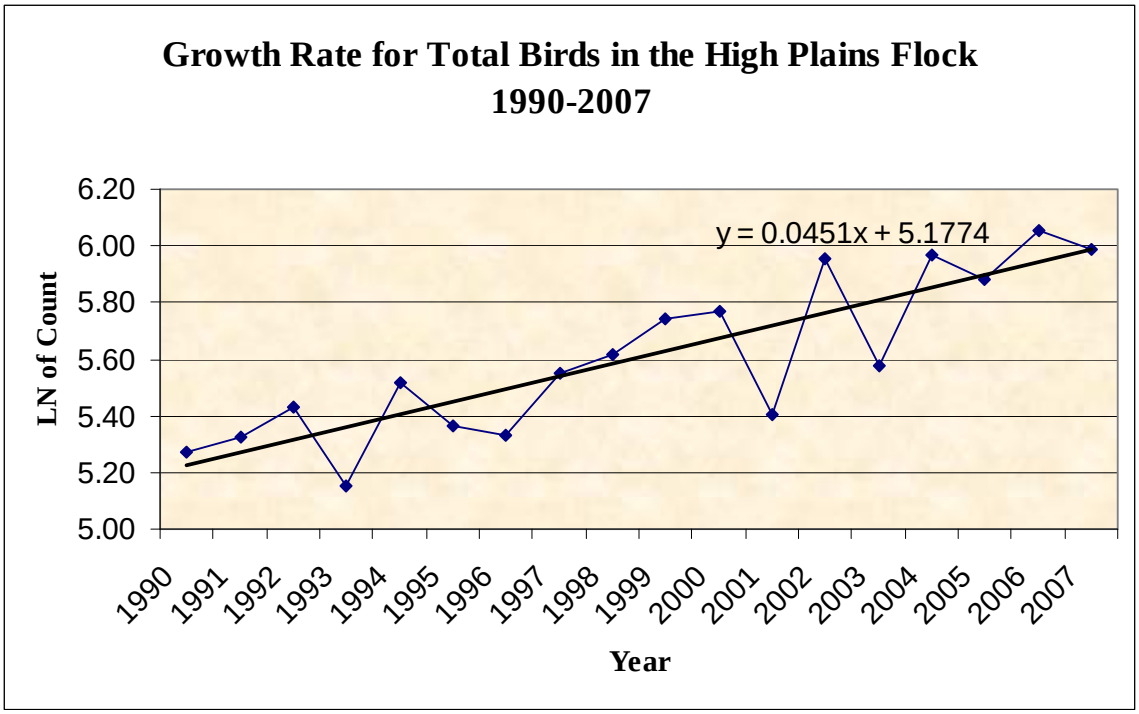


Figure 3. Growth rate of the HPF derived from the natural log of swans counted during fall production surveys from 1990 to 2007. The growth rate = 4.5% per year (R^2 = 0.74, P = 0.00).

Table 1. Results of the 2006 and 2007 fall production survey of High Plains Flock trumpeter swans.

Population parameter	2006	2007
Adults and subadults	360	321
Cygnets	67	77
Total swans	427	398
Adults and subadults in groups	93	111
Total flocks	12	13
Pairs with cygnets	35	32
Pairs without cygnets	89	69
Singles with cygnets	1	1
Singles without cygnets	18	7
Total broods	20	33
Mean brood size	2.16	2.33

Discussion

Habitat Conditions

Most of the breeding pairs were located on high quality wetlands (i.e., marshes with good water quality and food resources) within 75 miles of Lacreek National Wildlife in the sandhills area. These wetlands are springfed and many still contained adequate water and food resources when the swans initiated nesting. However, many wetlands were dry,

especially in the western and northern portions of the survey area. Precipitation in the survey area was well below historic values this year, resulting in moderate to severe drought conditions during July and August in western portions of the survey area (Fig. 4). Precipitation was steady early in the spring and early summer, but declined dramatically as summer progressed. Conditions continued to be favorable in the central and southeastern portions of the route, and swans have been expanding their range eastward according to Nebraska Game and Parks Commission personnel. Last year the route was extended farther east into the sandhills and biologists were able to count additional birds (24) in those areas.

Flock Status

The number of swans counted this year is just slightly lower than last year's record high count and was attributed to a decrease in nonbreeding pairs and single white birds. Still, the majority (68%) of the pairs observed had no cygnets, and the number of white birds in groups continues to increase. This may be because many of the white birds counted have not reached breeding age or are just maturing. In 2004 a record number of cygnets were counted, and these birds are now three years old and are likely reproductively mature but may not be breeding because of limited nesting habitat. Also, many of the highest quality wetlands are occupied by pairs that nest at these locations year after year. Due to the drought conditions, such high quality breeding habitat for newly formed pairs may have been limited. Although production was relatively low in 2006, an increase in production was observed this year as indicated by an increase in cygnets, number of broods, and average brood size.

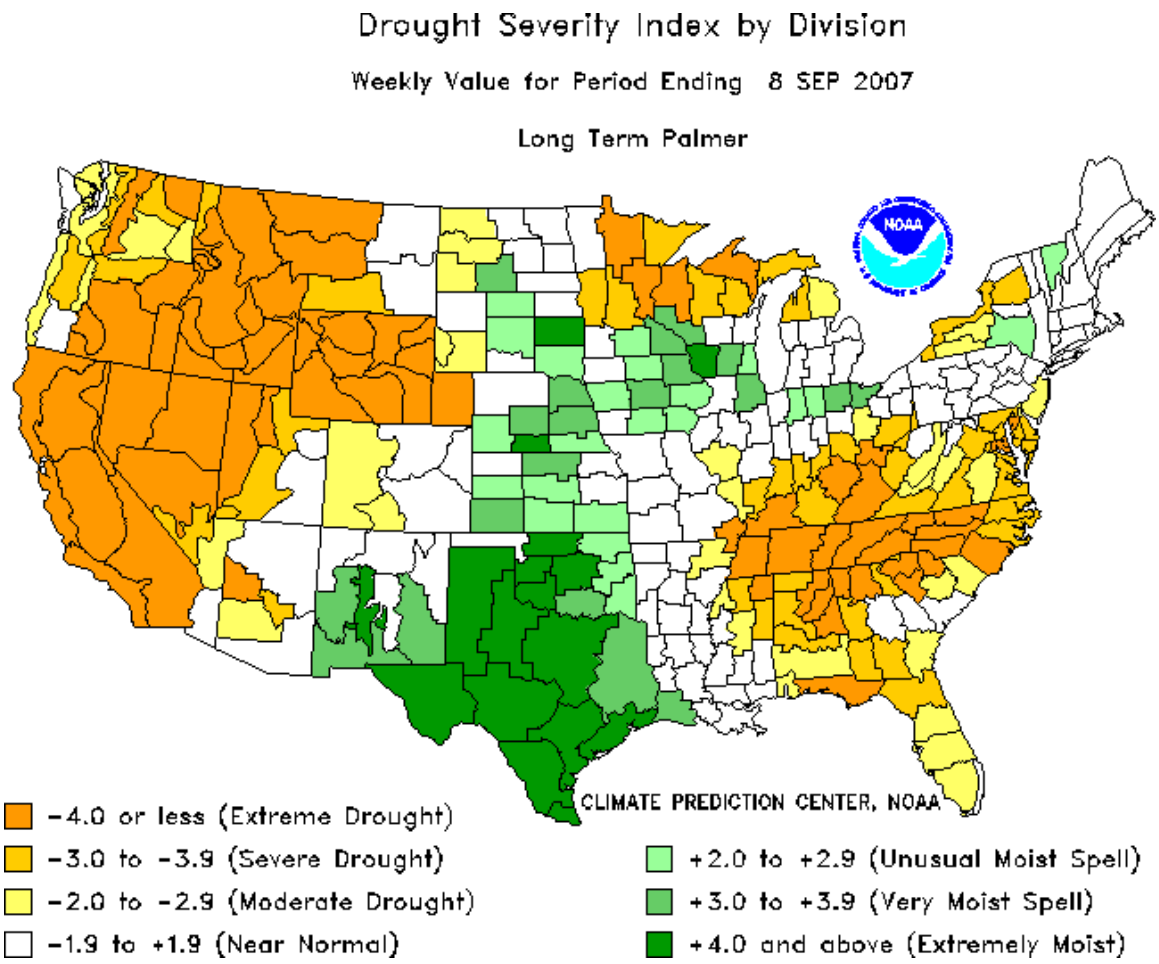


Figure 4. NOAA map of drought conditions just prior to the survey.

References

Comeau-Kingfisher, S., and T. Koerner. 2005. Management plan for the High Plains Trumpeter Swan Flock. U.S. Fish and Wildlife Service, Lacreek National Wildlife Refuge. Martin, SD. 19pp.

Subcommittee on the Interior Population of Trumpeter Swans. 1997. Mississippi and Central Flyway Management Plan for the interior population of trumpeter swans. Mississippi and Central Flyway Councils. [c/o/ USFWS, Migratory Coordinator] Twin Cities, MN. Unpubl. rept. 51pp.

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Appendix A. Survey results by location for the High Plains Flock, 2007. W.B. = White bird (adult/subadult), N.B.P.= non-breeding pair, and B.P. = breeding pair.

			Swans			
State	**W.B. Single**	**B.P.**	**Cyg.**	**N.B.P**	**Group**	**Comments**
SD	1	8	14	11	38	9/4/06
NE	0	2	9	8	3	
Subtotal	**1**	**10**	**23**	**19**	**41**	**123**
SD	0	1	2	1	6	9/5/06
NE	4	16	34	38	58	
Subtotal	**4**	**17**	**36**	**39**	**64**	**216**
NE	3	5	18	11	6	9/6/07
Subtotal	**3**	**5**	**18**	**11**	**6**	**59**
TOTAL	**8**	**32**	**77**	**69**	**111**	**398**